

REMARKS

Claims 1-31 and 75-85 are pending. Claims 1, 2, 5-7, 10-14, 16, 19, 23-31, 80, 82, and 83 are amended. New claims 86-100 are added. Support for the amendments can be found at page 14, lines 16-17, page 13, original claims 11 and 29, page 7, line 30, figures 3, 7b, 10c, page 2, lines 27-30, page 15, lines 17-26, and elsewhere in the specification. Support for the added claims can be found at page 13, lines 3-21, page 14, lines 17-22, page 15, lines 1-26, page 19, line 27, and elsewhere in the specification.

Claim Objections

The objectionable terms “m” was an artifact of electronic file transfer. Each of the claims remained with the claim identifier “original.” Therefore, the claims are now maintained as original with the original units “μm”.

Allowable Claims

Claims 23, 31, 80, and 81 have been indicated as containing allowable subject matter. The independent process claims 10 and 27 have now been amended to recite limitations that are similar to the limitations in these allowable claims.

Rejection as Anticipated by Yamashita et al.

Claims 1-4, 6-13, 15, 27-30, 75, 78, 79, 82 83 and 85 have been rejected under 35 USC §102(b) as anticipated by Yamashita et al. JP 2000-329490.

The claims, as presently amended, are not taught or suggested by Yamashita et al. For example, independent claim 1 recites plural flow paths connected to a common header. This feature is not taught or suggested by Yamashita et al.

Independent claims 10, 13 and 27 recite unit operations selected from the group consisting of distilling, adsorbing, compressing, expanding, separating, absorbing, and vaporizing, and condensing. These unit operations are not taught or suggested by Yamashita et al.

Accordingly, withdrawal of this rejection is respectfully requested.

Rejection as Anticipated by Symonds

Claims 1-10, 13-16, 17, 21, 27-30, 75, 76, 78, 79, and 80 have been rejected under 35 USC §102(a) as anticipated by Symonds WO 01/35043.

Independent claim 1, as amended, recites edge features. These are not taught or suggested by Symonds. In fact, claim 11, which contains essentially the same limitation was not rejected over Symonds.

Independent claim 5, as amended, recites a multiplicity of catalysts or a catalyst and sorbent in the device. This is not taught or suggested by Symonds.

Independent amended claims 10, 13, and 27 recite unit operations or combination of unit operations that are not taught or suggested by Symonds. In this respect, claims 10 and 27 are similar to the claims which have been identified as allowable.

Accordingly, withdrawal of this rejection is respectfully requested.

Rejection as Obvious Over Yamashita et al.

Claims 24-26 have been rejected under 35 USC §103(a) as obvious over Yamashita et al.

Claim 24, as amended recites a microchannel flow path. As explained in Applicants' specification, the invention represents a radical new configuration for microchannel technology. All prior microchannel devices were oriented such that the microchannels ran along the length of the shim (or plate). Microchannels devices having the conventional orientation could be made by etching microchannels into a plate or wafer. This was well developed technology from the electronics industry. Alternatively, channels could be made by stamping; in this fashion, the channel height would be defined by the thickness of the shim from which the microchannels were stamped. No one had thought to make process microchannels in the direction parallel to shim thickness. Furthermore, no one had recognized any advantage from this orientation, for example, no one had recognized any advantage for constraining high interstream pressure differentials within microchannels using this configuration.

It would not have been obvious to size the flow paths of Yamashita et al. to microchannel dimensions because the prior art does not provide any motivation to do so.

Furthermore, the Yamashita reference is not appropriate for an obviousness-type rejection because it is non-analogous art. Microchannel devices have special advantages and challenges that set them apart from conventionally sized devices. Microchannel processing is a subspecialty for chemical engineers. The skilled worker would study the microchannel art for ideas for designing a microchannel device. The skilled worker would not look to conventional designs since both the manufacture and expected performance would be expected to be radically

different. Therefore, the Yamashita reference is not analogous art and cannot be considered in a section 103 rejection. See MPEP 2141.01

Still further, the invention is not obvious over Yamashita because Yamashita does not provide an enabling description for making a microchannel heat exchanger. Yamashita does not provide any descriptions for how to make microchannels, nor to carefully align microchannels, nor to successfully bond sheets to form microchannels through a stack of sheets. “The consistent criterion for determination of obviousness is whether the prior art would have suggested to one of ordinary skill in the art that this process should be carried out and would have a reasonable expectation of success, viewed in light of the prior art.” *In re Dow Chemical Co.*, 837 F.2d 469, 473, 5 USPQ2d 1529, 1531 (Fed. Cir. 1988), cited in MPEP 2144.08. Since the skilled worker would not have a reasonable expectation of success for modifying the Yamashita design to make a microchannel device, the invention of claim 24 is not obvious in view of Yamashita.

Accordingly, withdrawal of this rejection is respectfully requested.

Rejection as Obvious Over Symonds

Claims 18-20, 22, 24-26, 77 and 84 have been rejected under 35 USC §103(a) as obvious over Symonds.

Except for claim 24, the rejected claims are dependent claims. In view of the amendments, the independent claims are allowable. Therefore, the dependent claims are also allowable.

With regard to independent claim 24, the same arguments as set forth above apply in this case also.

Accordingly, withdrawal of this rejection is respectfully requested.

Conclusion

If the Examiner has any questions or would like to speak to Applicants' representative, the Examiner is encouraged to call Applicants' attorney at the number provided below.

Respectfully submitted,

Date: __17 April 2007

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